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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/944,541	08/31/2001	Crispin L. DeBellis	6149	5180

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EXAMINER

RIDLEY, BASIA ANNA

ART UNIT

PAPER NUMBER

1764

DATE MAILED: 09/10/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	09/944,541	DEBELLIS ET AL.	
	Examiner Basia Ridley <i>BR</i>	Art Unit 1764	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

1) Responsive to communication(s) filed on 25 June 2003.

2a) This action is **FINAL**.      2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

4) Claim(s) 1-22 is/are pending in the application.

4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

5) Claim(s) \_\_\_\_\_ is/are allowed.

6) Claim(s) 1-22 is/are rejected.

7) Claim(s) \_\_\_\_\_ is/are objected to.

8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on 31 August 2003 is/are: a) accepted or b) objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) The proposed drawing correction filed on \_\_\_\_\_ is: a) approved b) disapproved by the Examiner.

    If approved, corrected drawings are required in reply to this Office action.

12) The oath or declaration is objected to by the Examiner.

#### Priority under 35 U.S.C. §§ 119 and 120

13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) All    b) Some \*    c) None of:

    1. Certified copies of the priority documents have been received.

    2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.

    3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    \* See the attached detailed Office action for a list of the certified copies not received.

14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

    a) The translation of the foreign language provisional application has been received.

15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

#### Attachment(s)

1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____.
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)
3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.	6) <input type="checkbox"/> Other: _____

## **DETAILED ACTION**

### ***Response to Amendment***

1. The claim(s) as originally filed were not numbered consecutively, as claim 28 was followed by claim 30. See 37 CFR 75(f). Misnumbered claim(s) 30-45 have been renumbered 29-44, respectively. Claim dependencies were corrected accordingly. Accordingly, regarding applicant's request to cancel not elected claims 23-45, the examiner notes that renumbered not elected claims 23-44 were cancelled.

### ***Election/Restrictions***

2. Applicant's election without traverse of Invention I-A, Species (i) in Paper No. 4 is acknowledged.

### ***Specification***

3. The disclosure is objected to because of the following informalities:

- the current status of all referenced nonprovisional parent applications should be included (e.g. [010], [012] or [014]);
- [055] "outer and inner cylinder 120, 140" should be replaced with --outer and inner cylinder 140, 120--
- [062] "out cylinder" should be replaced with --outer cylinder--;
- [065] "Fig. 4" should be replaced with --Fig. 5--.

Appropriate correction is required. Applicant is reminded that no new matter shall be added.

***Drawings***

4. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because Fig. 7 does not include the following reference sign(s) mentioned in the description: "220" as recited in [067]-[070]. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

5. The drawings are objected to because in Fig. 1-3 and 6 various elements are vaguely identified. Specifically it is not clear what exactly is being indicated by reference numbers 200, 140, 120, 20, 25, as it is not clear what structural elements are the lead lines for said reference numbers pointing to. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

***Claim Objections***

6. Claim(s) 1-22 is/are objected to because of the following informalities:

- in claim(s) 1 recitation "an outer cylinder surrounding the inner outer cylinder" should be replaced with --an outer cylinder surrounding the inner cylinder--.

Appropriate correction is required. Applicant is reminded that no new matter shall be added.

7. Claims 1-22 are objected to because the terminology used in claims is not consistent with terminology used in the specification. While the specification describes outer cylinder surrounding an inner cylinder and an central core structure in the annular area between the outer and the inner cylinders, the claims recite an outer cylinder surrounding a central core structure and an inner cylinder in the annular area between the outer cylinder and the central core structure (e.g. claim 1

recites: “an inner cylinder forming an inner area, an outer cylinder surrounding the inner cylinder and forming an annular area therebetween” and claim 6 recites “a central core structure located within the inner area”).

***Claim Rejections - 35 USC § 112***

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claim(s) 14-16, 18 and 21 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 14 and 21 is/are vague and indefinite, because the recitation of “the catalyst means deposited on (...) the outer cylinder” or “the catalyst means (...) in fluidic contact with (...) the annular area” in said claims is not consistent with catalyst means as recited prior to said recitation. Claims 14 and 21 depend from claim 13, which in turn depends from claims 1. Since claim 13 recites “catalyst means for catalyzing a reaction to convert the first fluid” and first fluid is defined in claim 1 as fluid passing only through the inner area (claim 1 defines the fluid passing through the annular area as a second fluid) there is lack of antecedent basis for catalyst means in fluidic contact with the annular area.

Claim 18 is vague and indefinite, because the recitation of “the catalyst means deposited on (...) the outer cylinder” in said claim is not consistent with catalyst means as recited prior to said recitation. Claim 18 depends from claim 17, which in turn depends from claims 1. Since claim 17 recites “catalyst means for catalyzing a reaction to convert the first fluid” and first fluid is defined in claim 1 as fluid passing only through the inner area (claim 1 defines the fluid passing through the

annular area as a second fluid) there is lack of antecedent basis for catalyst means in fluidic contact with the annular area.

***Claim Rejections - 35 USC § 103***

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 1 and 5-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pinto (USP 4,750,986).

Regarding claim 1, Pinto discloses annular reactor assembly for exchanging heat between at least two separate fluid streams, the reactor comprising:

- an inner cylinder (28, 128, 210, 410) forming an inner area;
- an outer cylinder (10, 110) surrounding the inner cylinder (28, 128, 210, 410) and forming an annular area therebetween (C1/L38-50);
- fins (214, 216, 217, 414, 415, 416) which extend at least partially into at least one of the inner area and the annular area, and which are oriented in an essentially longitudinal direction along a circumference of at least one of the inner tube and the outer tube.

Additionally while Pinto does not explicitly discloses a control means for selectively controlling heat transfer between the first fluid passing through the inner area and a second fluid passing through the annular area, as the reference discloses flow of first fluid in said inner area and flow of second fluid in said annular area (Fig. 1), and as the disclosed reactor has to have means for starting and stopping the operation, a presence of said control means (e.g. valves) is inherent.

Regarding the recitation that said control means is connected to a terminal end of at least one of the inner cylinder and the outer cylinder, said recitation is not considered to confer patentability to the claim. Since it has been held that rearranging parts of an invention involves only routine skill in the art, see *In re Japikse*, 86 USPQ, it would have been obvious to one of ordinary skill in the art to connect said control means to a terminal end of at least one of the inner cylinder and the outer cylinder.

With respect to claim(s) 5, it would have been obvious to one having ordinary skill in the art at the time the invention was made to make control and monitoring system of Pinto automatic, since it has been held that broadly providing a mechanical or automatic means to replace manual activity which has accomplished the same result involves only routine skill in the art. *In re Venner*, 120 USPQ 192 (CCPA 1958); *In re Rundell*, 9 USPQ 220 (CCPA 1931).

Regarding claims 6-22, Pinto discloses annular reactor assembly further comprising:

- a central core structure located within the inner area (40, 140, 212, 412) located within the inner area;
- wherein the fins are oriented in an essentially longitudinal direction along a circumference of the central core structure (Fig. 1, 2 and 4a);
- wherein the central core includes a hollow portion capable of housing other components (Fig. 4b, C10/L3-13);
- wherein the fins are arranged in a pattern including at least one of straight, rectangular offset strip, offset strip, perforated, triangular, louvered and wavy (Fig. 1-4 and C1/L58-64);
- wherein the fins are constructed to optimize at least one of: the heat transfer between the first fluid and the second fluid, a flow pattern of the first fluid of the second fluid within the respective

inner area of the annular area, and to provide structural support between the inner cylinder and the outer cylinder (Fig. 1-4 C3/L23-C4/L11 and C10/L28-47);

- wherein the fins are constructed to optimize at least one of: the heat transfer between the first fluid and the second fluid, a flow pattern of the first fluid of the second fluid within the respective inner area of the annular area, and to provide structural support between at least two of: the central core structure, the inner cylinder and the outer cylinder (Fig. 1-4 C3/L23-C4/L11 and C10/L28-47);
- further comprising catalyst means for catalyzing reaction to convert the first fluid into a desired end product (C4/L27-68, C7/L50-58);
- wherein the catalyst means is deposited on at least one of: the fins, the inner cylinder and the outer cylinder (C4/L27-68, C7/L50-58);
- wherein the catalyst means is deposited on at least one of: the fins, the inner cylinder and the outer cylinder and the central core (C4/L27-68, C7/L50-58);
- wherein a catalyst means is in fluidic contact with the inner area and the annular area, wherein first catalyst means generates combustion reactions and hydrogen reforming reactions, and wherein the combustion reactions occur in either the inner area or the annular area and the hydrogen reforming reactions occurs wherever combustion reactions are not occurring (C4/L27-68, C7/L50-58, C5/L14-27);
- wherein there are two separate catalyst materials, the first catalyst material being specifically formulated to generate combustion reaction and the second catalyst material being specifically formulated to generate hydrogen-reforming reaction (C4/L27-68, C7/L50-58, C5/L14-27).

12. Claims 2-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pinto (USP 4,750,986), as applied to claim 1 above, in view of Shane, Jr. (USP 3,500,899).

Regarding claims 2-4 Pinto discloses all of the claim limitations as set forth above, but the reference does not disclose said control means comprising a variable cover comprising a plurality of overlapping plates fixed to central pivot or an expanding fan fixed to a central pivot.

Shane, Jr. establishes that a control means comprising a variable cover comprising a plurality of overlapping plates fixed to central pivot or an expanding fan fixed to a central pivot are efficient means of control of flow and/or heat exchange between two fluids (C1/L10-35, C3/L3-12 and Fig. 1-6).

In view of above teaching, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the known control means of Shane, Jr. in the reactor of Pinto, as doing so would amount to nothing more than use of a known apparatus for its intended use in a known environment to accomplish entirely expected result.

13. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

***Conclusion***

14. In view of the foregoing, none of the claims are allowed.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to examiner Basia Ridley, whose telephone number is (703) 305-5418. The examiner can normally be reached on Monday through Thursday, from 8:30 AM to 7:00 PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola, can be reached on (703) 308-6824.

The fax phone number for Group 1700 is (703) 872-9311 (for Official papers after Final), (703) 872-9310 (for other Official papers) and (703) 305-6078 (for Unofficial papers). When filing a fax in Group 1700, please indicate in the Header (upper right) "Official" for papers that are to be entered into the file, and "Unofficial" for draft documents and other communication with the PTO that are not for entry into the file of the application. This will expedite processing of your papers.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 308-0661.

*BR*  
Basia Ridley  
Examiner  
Art Unit 1764

BR  
September 8, 2003

*Hiem Tran*

**HIEN TRAN**  
**PRIMARY EXAMINER**